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EP 0043903

(58) Field of search

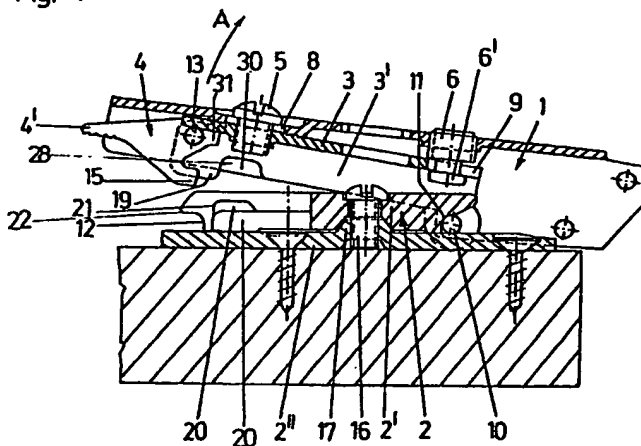
E2F

Selected US specifications from IPC sub-class E05D

(54) A hinge

(57) A hinge comprises a hinge arm (1) which is snapable onto a mounting plate (2) by means of an intermediate member (3). The intermediate member (3) is at the front engageable in the mounting plate (2) and at the rear provided with a pivot lever (4) on which a hook member (15) is formed by means of which the pivot lever (4) is lockable with the mounting plate (2). Centering means are provided which are formed for example by a locking bolt (18) extending into a notch (32) of the mounting plate (2) or by noses which abut on the base member (20) of the mounting plate (2).

Fig. 1



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Fig. 2

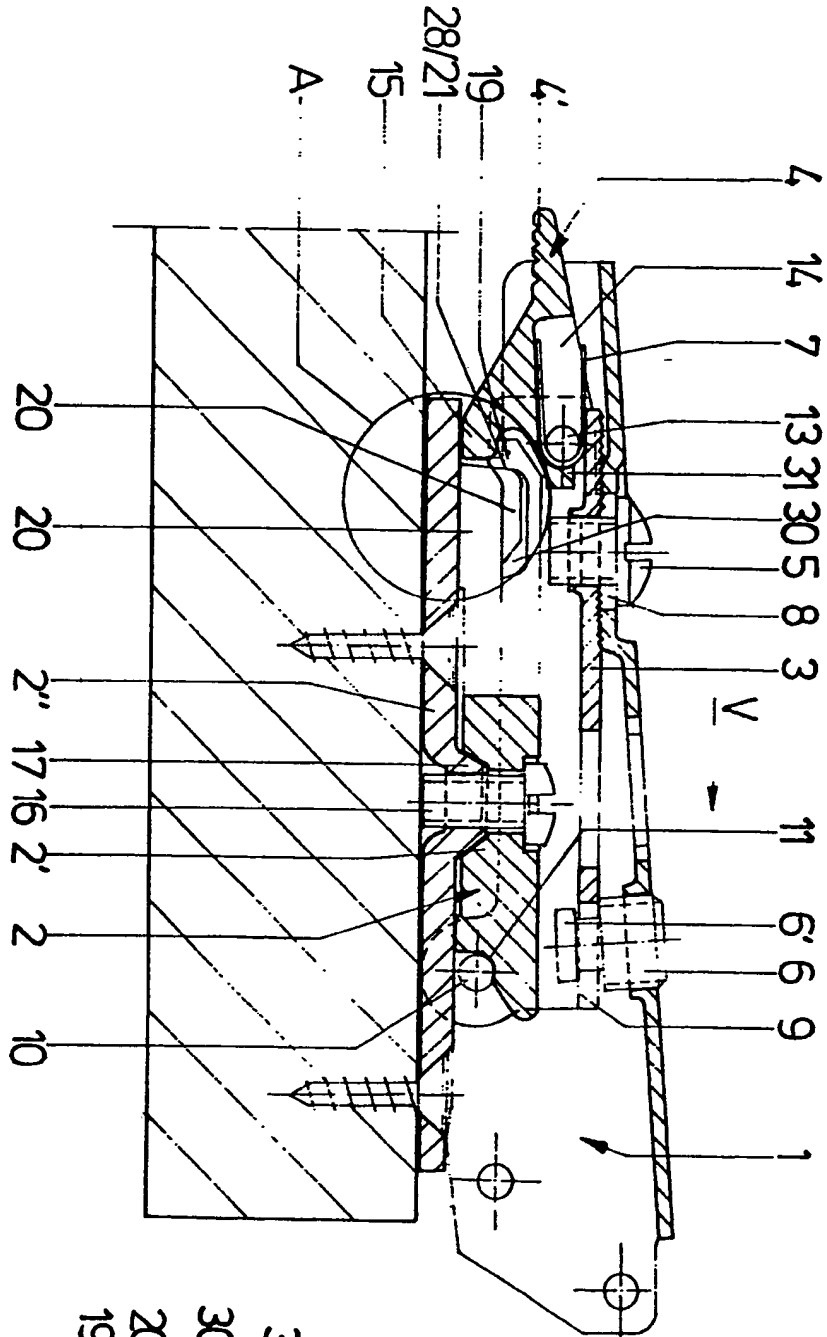
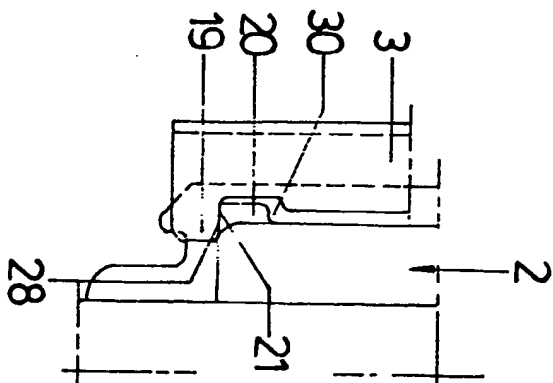


Fig. 3



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Fig. 4

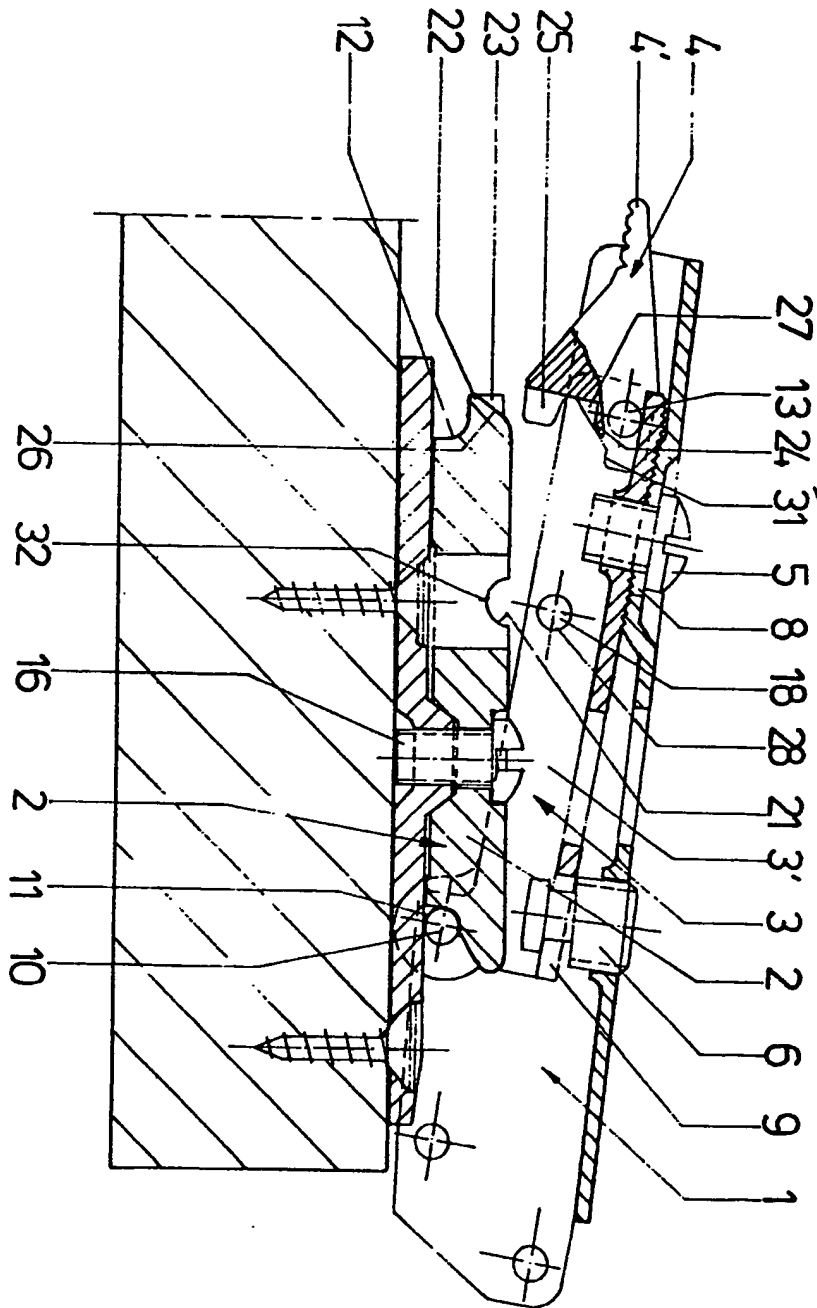
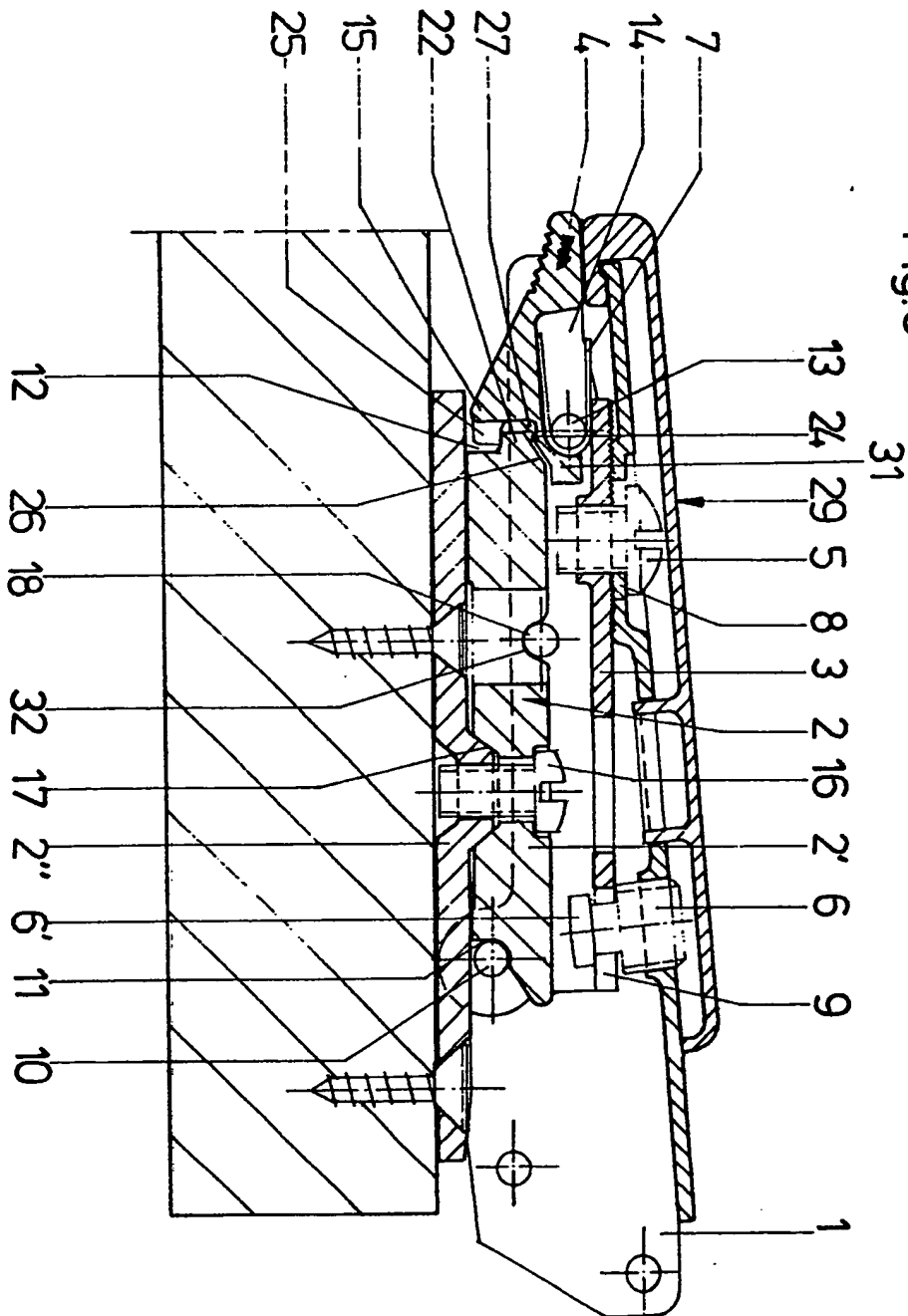


Fig. 5



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Fig. 7

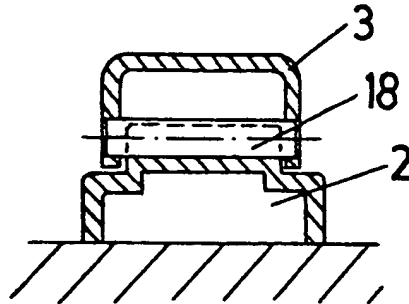


Fig. 6

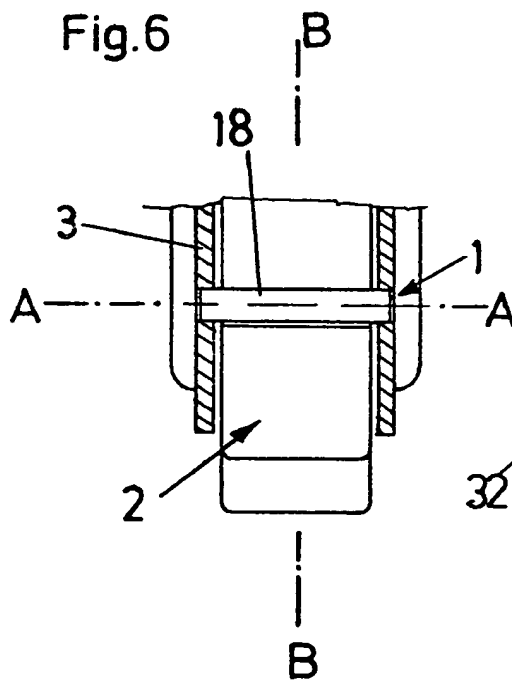
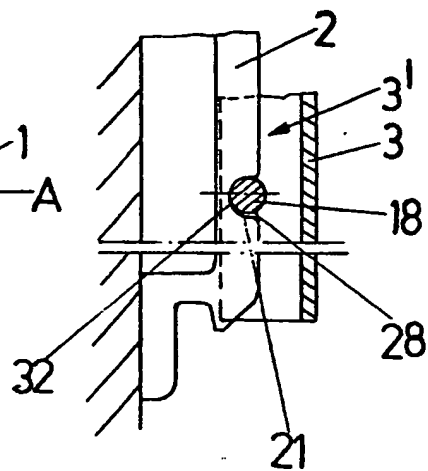


Fig. 8



SPECIFICATION

A hinge

- 5 The invention relates to a hinge with adjusting means, in which a hinge arm is by means of at least one intermediate member fastenable to a mounting plate and by means of hinge links of the like connected with a second hinge part, for example a hinge casing, the intermediate member being at one end engageable in the mounting plate and pivotable thereon by means of a pivot bearing, and at the other end lockable by means of a pivot lever which is pivotally mounted at the intermediate member and comprises a hook member engaging at a projection of the mounting plate.

In conventional hinges the hinge arm is fastened to the mounting plate by means of a clamping screw, said clamping screw generally extending through an elongated hole to allow an adjustment of the hinge arm in the depth of the piece of furniture.

- 20 Lately snap-in connections for fastening the hinge arm to the mounting plate have become known. DE-A-30 26 796 and 30 39 328, for example, show hinges with a hinge arm and a fastening plate in which the two parts to be locked snap into each other by inserting the hinge arm in a guiding of the fastening plate and by displacing the same in longitudinal direction. A similar way of locking a hinge arm to a mounting plate is described in DE-A-24 60 127. DE-A-32 41 284 shows a hinge in which the hinge arm is insertable into lateral guidings of a mounting plate and clampable to the mounting plate by means of an eccentric.

- The above-described ways of locking the hinge arm have the advantage that the hinge arm can be very quickly fixed to the mounting plate when the piece of furniture is being assembled, and that no tool is required for the mounting operation. This advantage is not unimportant because the door must be held, while the hinge arms are mounted. When, for example, the door is held with one hand and the hinge arm which is being mounted with the other hand, a second person is frequently required who fastens the clamping screw with a screw driver, when the hinge arm is to be locked by means of a clamping screw.

It is a disadvantage of hinges in which the hinge arm or the intermediate member must be inserted into the mounting plate from the front is that tilting frequently occurs. This is particularly the case with high doors which carry many hinges.

- AT-PS 360 856 describes a hinge whose intermediate member is engageable at one end in the mounting plate and at the other end provided with a pivot lever by means of which the intermediate member is lockable to the mounting plate. The scope of the invention is to improve such a hinge.

The invention is based on the problem to hold the mounted hinge arm on the mounting plate without clearance as far as possible.

- EP-A3-0 043 903 describes a hinge comprising a hinge arm which is adapted to be pushed onto a mounting plate and held by a catching lever acted upon by a spring. The spring and the catching lever press the hinge arm permanently against a stop of

the mounting plate. It is a disadvantage of this arrangement that secure supporting of the hinge arm is dependent on the force of the spring and that the spring must continuously hold the hinge arm, i.e. over a period of many years.

- 70 It is the object of the invention to improve a hinge of the above-described kind. The clearance between the intermediate member and the mounting plate should be reduced to the greatest possible extent without producing a continuous stress on the actual locking means.

According to the invention this is achieved by providing a positioning surface at the intermediate member which is staggered with respect to the pivot bearing in the depth of the piece of furniture, said positioning surface abutting on a countersurface of the mounting plate, when the intermediate member has been mounted on the mounting plate, and positioning the intermediate member together with the pivot bearing preferably without clearance in the depth of the piece of furniture.

- Since the hinge arm is positioned without clearance by means of rigid parts of the intermediate member and the mounting plate, the hinge arm is absolutely securely held over long periods of time. The spring which acts upon the pivot lever serves only to press the latter-mentioned behind the projection of the mounting plate in the mounting operation. The intermediate member is held on the mounting plate by positive locking.

An embodiment of the invention provides that a nose is provided at the intermediate member which lies behind the countersurface of the mounting plate, when the intermediate member has been mounted on the mounting plate.

- It may be provided that the intermediate member has a U-shaped cross section and that a nose is formed at each lateral flange, and that the mounting plate comprises a base member at each side. The countersurfaces, each, are provided at the base members.

One embodiment provides that the nose is arranged adjacent to the hook member of the pivot lever.

- To improve supporting of the intermediate member and to provide centering means, it is provided that the lateral flanges of the intermediate member have recesses arranged directly in front of the noses onto which the base members of the mounting plate extend.

- 115 A further embodiment of the invention is characterized in that the stop surface is arranged at a locking bolt which lies transversely to the longitudinal center axis of the mounting plate and of the hinge arm, is mounted at the intermediate member and engages in a notch of the mounting plate, the wall of said notch forming the countersurface.

It is advantageously provided that said notch is semi-circular and has different radii. The notch is advantageously disposed in the rear half of the mounting plate.

- 125 The intermediate member with the locking bolt can be manufactured with a precision to reduce the clearance of the parts to an optimum extent.

It will be appreciated that the arrangement of the structural parts could also be reversed. The locking

bolt could also be formed at the mounting plate and extend into an opening in the intermediate member. According to the invention it is also possible to mount the pivot lever at the mounting plate to engage with its hook member at the intermediate member.

Two embodiments of the invention will now be described in more detail with reference to the figures of the drawings in which *Figure 1* is a longitudinal sectional view of a hinge arm and a mounting plate in the position when the hinge arm is being engaged.

Figure 2 is a longitudinal sectional view of the hinge arm and the mounting plate, when the hinge arm is in the mounted position.

Figure 3 is a side view of the mounting plate and of the intermediate member in the region of the stops,

Figure 4 is a longitudinal sectional view of a hinge arm and a mounting plate in the position when the hinge arm is being engaged in the second embodiment,

Figure 5 is a longitudinal sectional view of the hinge arm and the mounting plate, when the hinge arm is in the mounted position,

Figure 6 is a horizontal sectional view of the intermediate member in the region of the locking bolt,

Figure 7 is a sectional view along line A-A of *Figure 6*, and

Figure 8 is a sectional view along line B-B of *Figure 6*.

The hinge parts which are not directly related to the invention are not shown in the figures of the drawings, such as the hinge casing and the hinge links, because they are made according to the state of the art.

As can be seen from the figures of the drawings, the essential parts of the hinge are the hinge arm 1, the mounting plate 2 and the intermediate member 3 with the pivot lever 4.

The hinge arm 1 is fastened to the intermediate member 3 by means of a joint adjustment screw 6 which is mounted in a female thread in the hinge arm 1 and by means of a clamping screw 5 which also serves for the depth adjustment. The clamping screw 5 projects through a slot 8 in the hinge arm 1, and the joint adjustment screw 6 is with its head 6' also held in a slot 9 in the intermediate member 3. By releasing the clamping screw 5, the hinge arm 1 can be displaced over the length of slot 8 and thus be adjusted in the depth of the piece of furniture. The adjustment in the direction of the door joint is effected in a conventional manner by turning the joint adjusting screw 6.

The intermediate member 3 has a U-profile. The mounting plate 2 is inserted between the legs 3' of the intermediate member 3.

At its front the intermediate member 3 is provided with a pin 10 which serves as a holding projection of the intermediate member 3. The mounting plate 2 has a notch at its front into which pin 10 is engageable to be held at the mounting plate 2.

At its rear end the mounting plate 2 is also provided with a notch 12.

The pivot lever 4 is mounted at the rear end of the hinge arm 1 by means of a bolt 13. The hook member 15 is formed at the pivot lever 4.

The pivot lever 4 is acted upon by a spring so that, when the intermediate member 3 is mounted on the mounting plate 2, said pivot lever snaps automatically into the notch 12.

The illustrated embodiment shows a leg spring 7 which is mounted in a recess 14 of the pivot lever 4 and abuts with one end on the intermediate member 3.

When the hinge arm 1 is with the intermediate member 3 pressed from the position illustrated in *Figure 1* into the position illustrated in *Figure 2*, the hook member 15 engages in the notch 12 and the hinge arm 1 is locked at the mounting plate 2.

To avoid unintentional displacement of the hinge arm 1 in the forward direction, i.e. in the direction of arrow V of *Figure 2*, the intermediate member 3 is at the two lateral flanges 3', each, provided with a nose 19. When the hinge arm is in the mounted position, the noses 19 are positioned directly behind base members 20 of the mounting plate 2. They advantageously abut with their positioning surfaces 28 directly at the countersurface 21 of the base members 20. In this arrangement the pivot lever 4 must prevent only that the hinge arm 1 is lifted from the mounting plate 2 in the direction of arrow A. This means that minimal forces only are to be received. The great forces which act in the direction of arrow V are received between the noses 19 and the base members 20 by positive locking.

To facilitate and improve centering of the unit hinge arm 1 and intermediate member 3 on the mounting plate 2, recesses 30 extending into the base members 20 are provided directly in front of the noses 19.

The noses 19 and the base members 20 are positioned directly beside the hook member 15 of the pivot lever 4.

In the embodiment according to *Figures 4* to *11*, the intermediate member 3 has a locking bolt 18 which is positioned in the rear half with respect to the length and mounted between the legs 3' of the intermediate member 3. The outer surface of locking bolt 18 forms the positioning surface 28. When the intermediate member 3 has been mounted on the mounting plate 2, the locking bolt 18 comes to rest in a semicircular notch 32 of the mounting plate 2. Centering of the intermediate member 3 on the mounting plate 2 is thus obtained and undesired clearance between the two parts is avoided. The front side of the notch 19 forms the countersurface 21. The locking bolt 18 corresponds to the noses in respect of its function.

To facilitate engagement of the locking bolt 18, the notch 32 has, as particularly shown in *Figure 5*, different radii. When the intermediate member 3 is in the mounted position, the locking bolt 18 rests snugly at the front wall of notch 32.

After mounting of the hinge arm 1 at the intermediate member 3, the hinge arm 1 is adjusted in the above-described manner.

In both embodiments the centering part which carries the positioning surface 28 is a rigid part of the intermediate member 3.

A handle 4' is formed at the pivot lever 4. If the hinge arm 1 is to be released from the mounting

plate 2, it is sufficient to lift said handle 4', whereupon the hook member 15 disengages from the notch 12 and the hinge arm 1 can with the intermediate member 3 be lifted from the mounting plate

5 2.

Said releasing operation is facilitated by the nose 31 at the pivot lever 4. Said nose presses onto the mounting plate 2 and acts like a lever. The locking bolt 18 can thus easily be released from the notch 32 even if there exists a certain bracing effect between the locking bolt 18 and the pin 10.

In the embodiment the hook member 15 of the pivot lever 4 is fork-shaped and comprises two prongs 25. The mounting plate 2 is at the projection 15 22 provided with a centrally arranged cam 23.

When the hinge arm 1 and the intermediate member 3 are being snapped onto the mounting plate 2, the prongs 25 of the hook member 15 move at both sides past the cam 23 and engage underneath projection 22. The countersurface 24 of the pivot lever 4 abuts on the cam 23, which means that the pivot lever 4 snugly embraces with the prongs 25 of the hook member 15 and with the countersurface 24 the projection 22 and the cam 23. The pivot lever 4 25 and hence also the intermediate member 3 and the hinge arm 1 are held at the rear end at the mounting plate 2 absolutely without clearance.

The intermediate member 3 is hence held at the mounting plate 2 by positive locking not only in the depth of the piece of furniture but also in the direction of the door joint.

To improve lateral supporting of the pivot lever 4 at the mounting plate 2, the embodiment according to Figure 1 provides lateral cheeks 27 at the pivot lever 4, said cheeks receiving cam 23 between them, when the intermediate member 3 is mounted at the mounting plate 2.

The terms upper, lower and lateral used in this specification do not relate to the hinge in the mounted position at the piece of furniture but to the figures of the drawings.

CLAIMS

45 1. A hinge comprising adjusting means, in which a hinge arm is by means of at least one intermediate member fastenable to a mounting plate and by means of hinge links or the like connected with a second hinge part, for example a hinge casing, the 50 intermediate member being at one end engageable in the mounting plate and pivotable thereon by means of a pivot bearing, and at the other end lockable by means of a pivot lever which is pivotally mounted at the intermediate member and comprises 55 a hook member engaging at a projection of the holding plate, wherein a positioning surface staggered with respect to said pivot bearing in the depth of the piece of furniture is provided at said intermediate member, said positioning surface abutting on a 60 countersurface of said mounting plate and positioning said intermediate member together with said pivot bearing preferably without clearance in the depth of the piece of furniture.

2. A hinge as claimed in claim 1, wherein a nose 65 is provided at said intermediate member and lies be-

hind said countersurface of said mounting plate, when said intermediate member has been mounted on said mounting plate.

70 3. A hinge as claimed in claim 3, wherein at least one base member carrying said countersurface is formed at said mounting plate.

4. A hinge as claimed in claim 2, wherein said intermediate member has a U-shaped cross-section and a nose at each lateral flange, and wherein said 75 mounting plate is provided with a base member at each side.

5. A hinge as claimed in claim 4, wherein said nose is positioned adjacent to said hook member of said pivot lever.

80 6. A hinge as claimed in claim 4, wherein said lateral flanges of said intermediate member have recesses directly in front of said noses, said base members of said mounting plate extending into said recesses.

85 7. A hinge as claimed in claim 1, wherein said positioning surface is arranged at a locking bolt which lies transversely to the longitudinal center axis of said mounting plate of said hinge arm, is mounted at said intermediate member and engages in a notch 90 of said mounting plate, the wall of said mounting plate forming said countersurface.

8. A hinge as claimed in claim 7, wherein said notch is disposed in the rear half of said mounting plate.

95 9. A hinge as claimed in claim 7, wherein said notch is semicircular and has different radii.

10. A hinge substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

DERWENT-ACC-NO: 1987-159290

DERWENT-WEEK: 198723

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TITLE: Pivot hinge for furniture - has hinged arm connected to mounting plate via coupling section

INVENTOR: BRUSTLE, K; ROCK, E ; RUPPRECHTE, H

PATENT-ASSIGNEE: BLUM GMBH JULIUS[BLUM]

PRIORITY-DATA: 1986AT-0000313 (February 10, 1986) , 1985AT-0003569 (December 10, 1985)

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GB 2183722 B	October 11, 1989	N/A	000	N/A

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
GB 2183722A	N/A	1986GB-0029520	December 10, 1986

INT-CL (IPC): E05D005/04, E05D007/04

ABSTRACTED-PUB-NO: EP 392570B

BASIC-ABSTRACT:

The hinge comprises a hinge arm (1) which is snapped onto a mounting plate (2) by an intermediate member (3). The intermediate member is at the front engageable in the mounting plate (2) and at the rear provided with a pivot

lever (4) on which a hook (15) is formed which the pivot lever is locable with the mounting plate (2). Centring guides provided which are formed for example by a locking bolt (18) extending into a notch (32) of the mounting plate (2) or by noses which abut on the base (20) of the mounting plate.

ABSTRACTED-PUB-NO: GB 2183722A

EQUIVALENT-ABSTRACTS:

Hinge with adjustment means, in which a hinge arm (1) may be secured to a baseplate (2) by means of an intermediate piece (3) and is connected to a second hinge stop part, for example a hinge pot, by means of an articulated lever or the like, the intermediate piece (3) being suspendible at one end in the baseplate (2), and being lockable at the other end by means of a tilt lever (4) rotatably mounted on the intermediate piece (3), which tilt lever (4) has a hooked part (15) which acts upon a projection (22) of the baseplate (2), a stop surface (28) being constructed on the intermediate piece (3) offset with respect to the suspension point in the depth of the item of furniture, which stop surface (28), when the intermediate piece (3) is placed on the baseplate (2), bearing against a counter surface (21) of the baseplate (2), and the intermediate piece (3) being positioned in the depth of the item of furniture, and the intermediate piece (3) of U-shaped profile being tiltable by way of a rotary bearing (10, 11) at the point at which it may be suspended in the baseplate (2), and the tilt lever (4) being acted upon by a spring (7), characterised in that there is provided, on the projection (22) of the baseplate (2) on the side remote from the plane of mounting thereof, a counter surface, parallel to the plane of mounting, for a stop surface (24) on the tilt lever (4), in the state secured to the baseplate also parallel to the plane of mounting, and in that the hooked part (15) and the stop surface (24) of the

tilt lever (4) fittingly surround the projection (22) with the counter surface.

GB 2183722B

The hinge comprises a hinge arm (1) which is snapped onto a mounting plate (2)

by an intermediate member (3). The intermediate member is at the front engageable in the mounting plate (2) and at the rear provided with a pivot lever (4) on which a hook (15) is formed which the pivot lever is locable with

the mounting plate (2). Centring guides provided which are formed for example

by a locking bolt (18) extending into a notch (32) of the mounting plate (2) or

by noses which abut on the base (20) of the mounting plate.

CHOSEN-DRAWING: Dwg.1/8 Dwg.1/8

TITLE-TERMS: PIVOT HINGE FURNITURE HINGE ARM CONNECT MOUNT PLATE COUPLE SECTION

DERWENT-CLASS: Q47

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N1987-119548